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# The Legacy of Zarathustra in the Philosophy of Pythagoras: Is the Pythagorean Theorem Zoroastrian?

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**Abstract.** This article explores the philosophical and historical intersections between Zarathustra, the ancient Persian prophet of Zoroastrianism, and Pythagoras, the pre-Socratic Greek philosopher. Drawing upon historical accounts, religious texts, and philosophical frameworks, the study investigates how Pythagorean doctrines—particularly the Theory of Opposites, ethical dualism, and the pursuit of divine wisdom—may have been influenced by Zoroastrian teachings. Emphasis is placed on the cosmological order, moral choice, and metaphysical principles shared by both traditions. Archaeological findings such as the Susa tablet, as well as historical events like Pythagoras's alleged contact with the Magi during captivity in Babylon, are examined as possible transmission points of Eastern knowledge into Greek thought. Through comparative analysis, the article argues that the ethical and spiritual legacy of Zarathustra played a formative role in shaping Pythagorean philosophy, contributing to the broader foundation of Western metaphysical inquiry.

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**Keywords.** Zarathustra, Pythagoras, Zoroastrianism, Theory of Opposites, Ancient Philosophy, Cross-cultural Transmission, Ethical Dualism.

## Introduction

The intellectual relationship between ancient Persian and Greek traditions has long been a subject of scholarly interest, particularly concerning the transmission of metaphysical and ethical ideas across early civilizations. Among the most intriguing, yet underexplored, parallels is the philosophical affinity between Zarathustra (Zoroaster), the prophet of Zoroastrianism, and Pythagoras, the pre-Socratic Greek philosopher. Although separated by over a millennium, various historical and textual indicators suggest that Pythagoras may have been indirectly influenced by Zarathustra's teachings, either through his reported travels to Persia or through the Magian traditions he encountered during his time in Babylon (Iamblichus, trans. 1818).

Zarathustra's dualistic worldview, grounded in the cosmic opposition of good and evil, truth and falsehood, formed the ethical core of Zoroastrian scripture known as the *Gathas*. These ideas, as noted by scholars such as Boyce (1979), deeply shaped not only Persian religious consciousness but also contributed to the moral frameworks of neighboring cultures, including post-exilic Judaism and early Greek philosophy. Pythagorean doctrines—especially the Theory

of Opposites—reveal striking conceptual similarities. As Afnan (1965) argues, the structure of Pythagorean metaphysics, with its emphasis on duality (limited/unlimited, light/dark, right/left), may reflect an echo of Zoroastrian cosmology, transmitted through intercultural contact in Mesopotamia during the sixth century BCE.

While direct historical proof of an encounter between Zarathustra and Pythagoras remains elusive, the philosophical and symbolic parallels warrant deeper investigation. This study explores these intersections, tracing the ethical, cosmological, and metaphysical continuities between the two thinkers and highlighting the possible routes—both intellectual and historical—by which Zoroastrian thought may have informed the foundations of Greek philosophy.

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## Historical Background and the Possibility of Contact

Zarathustra was born on March 26th, during the early days of spring in the year 1767 BCE. Pythagoras was born in 570 BCE in Samos, where he began his studies under the tutelage of Thales and Anaximander. When we analyze the birth dates of these two philosophers, it seems impossible that they could have met in person. However, several writings suggest that they did meet, or at least that Pythagoras received Zarathustra's teachings through Zoroastrian philosophers.

Anna Clower (1977) states that when Pythagoras was 18 years old, he went to study outside of Samos. It is said that he spent 12 years in Egypt studying with priests and also traveled to Persia to study under the guidance of Zoroaster. In those distant lands, he obtained extensive knowledge in mathematics and astronomy, as well as instruction in religions.

## The Theory of Opposites in Ancient Thought

Luciano De Crescenzo (1995), in his book *History of Greek Philosophy*, asserts that one of the defining encounters in the life of Pythagoras was the one he had with Zarathustra, in which Pythagoras learned from Zoroaster about the Theory of Opposites. Pythagoras believed that the universe was composed of harmonies between the Limited and the Unlimited, Form and Matter, and other such opposites. The following table presents the opposites.

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|---|---|---|---|---|---|---|---|
| Limited | Odd | Unity | Right | Rest | Light | Correct | Square |
| Unlimited | Even | Plurality | Left | Motion | Darkness | Incorrect | Oblong |

**Zarathustra's Ethical Dualism in the Gathas**

Zarathustra believed in the existence of two opposing ethical principles: Right and Wrong. This is what he said in the Gathas:

"Now I will speak to those who wish to hear about the two principles, which are of importance even to the wise. I too, with reverence for the Good Mind and deep consideration for Righteousness, will offer praise to the Lord, so that you may behold Radiant Happiness." (Gathas 3.1)

"Hear the best with your ears and consider with a bright mind. Then each man and each woman, for themselves, shall choose one of the discernments. Awaken to this Doctrine of ours, before the Great Event of Choice begins." (Gathas 3.2)

"Now, the two primal mentalities, known as twin imaginings, are one the better and the other the worse in thoughts, words, and deeds. Of these two, those who are beneficent choose rightly, but not so the malevolent." (Gathas 3.3)

"Now, when the two mentalities first came together, they created 'life' and what is 'not life.' Until the end of existence, the worse mind shall be for the wrongful, and the better mind shall be for the righteous." (Gathas 3.4)

"Of these two mentalities, the wrongful mentality chose the worst actions, while the more progressive mentality, as firm as a rock, chose Righteousness. Therefore, all those who wish to please the Wise God may do so by choosing true actions." (Gathas 3.5)

"Between these two mentalities, the seekers of false divinities did not choose rightly, for deception reached them in their deliberations. Thus, they chose the worse mind and hastily surrendered to fury, afflicting the existence of humanity." (Gathas 3.6)

## The Origins of "Love for Wisdom"

The Greek term *"sophos"* means knowledge or wisdom, and the term *"philos"* means love. *Philosophy* literally means "love of wisdom." Pythagoras was the first to use the term *philosophy*. He believed in a governing order of the cosmos and its inhabitants, and that men could achieve immortality by understanding that divinity already resides within them through the study of the nature of this order.

Zarathustra referred to "Wisdom" long before Pythagoras. Zarathustra used the term *Vohu-Manah*, which means "Wisdom" and clear thinking that leads to a life of righteousness. Thus, in practice, the love of wisdom was truly first proclaimed by Zarathustra, and later refined a bit more by Pythagoras (Abreu, 2000).

Pythagoras believed that philosophy, or the love of wisdom, was the path to the discovery of divine nature. Zarathustra agreed with this, and right at the beginning of the first stanza of the first hymn in the Gathas, Zarathustra seems to be searching for a state of wisdom that would allow him to carry out his actions within the framework of universal divine laws. This is what he said:

"Mazda, Wise God, with reverence and raised hands, I pray. First, I ask for support through the progressive mentality. Then, I pray that I may perform all my deeds, as they are based in the wisdom of the Good Mind, in precise accordance with the laws of Righteousness, so as to please You and the soul of the Living World." (Gathas 1.1)

## Astronomy and Calendar Reforms: Two Philosophers of the Heavens

Pythagoras and Zarathustra were astronomers. In this regard, according to Dr. Jafarey, "The Avesta and later scriptures show that Zarathustra improved, around 1725 BCE, the ancient Indo-Iranian calendar. The prevailing calendar at the time was lunisolar. The lunar year consisted of 354 days. An intercalary month every thirty months kept the calendar roughly aligned with the seasons."

Zarathustra was an astronomer; he founded an observatory and reformed the calendar by introducing an intercalary period of eleven days to make it a lunisolar calendar of 365 days, 5 hours, and a fraction. Later, the year was made purely solar, with each month having thirty

days. An intercalation of five days was added, along with the insertion of one additional day every four years to complete the year of 365 days, 5 hours, and a fraction. Still later, the calendar was corrected to become a strictly solar year of 365 days, 5 hours, 48 minutes, and 45.5 seconds. The year began precisely with the spring equinox each time, and thus there was no longer a need to add an extra day every four years or to have a leap year. This was the most accurate and refined calendar produced up to that point.

In astronomy, Pythagoras believed that the Earth was a sphere at the center of the Universe. He also recognized that the Moon's orbit was inclined toward the Earth's equator, and he was the first to identify that the evening star Venus was the same planet as the morning star Venus. Pythagoras had a philosophy based on "Mathematical Perfection," which at times worked against a strictly empirical scientific approach. However, there is an important idea in Pythagorean philosophy that had a lasting impact: the notion that all complex phenomena should be reduced to simpler phenomena. One should not underestimate the significance of this idea, which has proven to be powerful throughout the development of science, serving as a fundamental driving force for great scientists like Newton—and especially Einstein.

**Divine Order and Inner Realization**

For Pythagoras, the universe was not chaotic, but rather filled with a profound order that permeated both the visible world and the minds of men. One of the main elements of Pythagorean thought is the belief that human beings are already divine; we attain immortality not by becoming divine, but by realizing what is already within us. He believed this could be achieved through philosophy and by examining the order of the universe as revealed in the heavens, mathematics, music, and science.

For Zarathustra, a divine illumination called SERAOSHA reveals many divine faculties, which lead to the understanding of the principles that form the cosmos—an ordered universe. The universe was created good and is progressively moving toward fulfillment, as is the intention of its creator, Ahura Mazda (Songs 8 and 9 of the *Gathas*).

**Historical Encounters: Persia, Egypt, and Babylon**

In 525 BCE, Cambyses II, King of Persia, invaded Egypt. Polycrates abandoned his alliance with Egypt and sent 40 ships to join the Persian fleet against the Egyptians. After Cambyses

won the Battle of Pelusium in the Nile Delta and captured Heliopolis and Memphis, Egyptian resistance collapsed. Pythagoras was taken as a prisoner and brought to Babylon. *Iamblichus* writes that Pythagoras:

"...was transported by the followers of Cambyses as a prisoner of war. While he was there, he gladly associated with the Magi ... and was instructed in their sacred rites and learned a very mystical worship of God. He also achieved perfection in arithmetic and music, as well as in other mathematical sciences taught by the Babylonians..."

**Knowledge vs. Material Possessions**

In 520 BCE, Pythagoras left Babylon and returned to Samos. Polycrates had been assassinated in 522 BCE, and Cambyses died in the summer of 522 BCE, either by suicide or due to an accident. The deaths of these dictators may have been a factor in Pythagoras's return to Samos, although no clear explanation has been found regarding how he gained his freedom. Darius of Persia had taken control of Samos after the death of Polycrates and was ruling the island at the time of Pythagoras's return.

*Iamblichus* also stated that Pythagoras preached the importance of scholarship above all else and provided a list of reasons why knowledge is superior to material things or immoral virtues. First, one can exercise it independently, without the presence of others. Also, even when you impart knowledge to someone else, it remains with you, undiminished. Knowledge can be shared with everyone, whereas some things may belong only to certain people, in limited amounts, with restricted availability. Finally, a man of knowledge can take part in the governance of his country and contribute to society. In this regard, Zarathustra called upon his God and said:

"Grant me, through Righteousness, the riches of the Good Mind." (*Gathas* 11.2)

And then he added:

"I also recognized, Wise Lord, that serenity is Yours, and, O Creator of the Living World, that the wisdom of the mind is Yours, which has given the world the ability to choose between the one who is composed and the one who is not." (*Gathas* 4.9)

**The Susa Tablet: Mathematics Before Pythagoras**

The discovery of a 3,750-year-old clay tablet in Susa, Iran—now preserved in the British Museum—has reshaped scholarly understanding of the origins of mathematical knowledge long before the rise of classical Greek philosophy. This Old Babylonian artifact, known for its diagrammatic geometry, contains a method to calculate the radius of a circle using the vertices of an isosceles triangle, a procedure that reflects the core logic found centuries later in what became known as the Pythagorean Theorem.

This geometric formulation, predating Pythagoras by more than a millennium, strongly suggests that the principles of right-angled triangles, proportions, and numerical harmony were already being explored in Mesopotamia and Elamite Persia during the early second millennium BCE. Such tablets, along with others like Plimpton 322, show a sophisticated grasp of algebraic thinking and trigonometric reasoning, developed independently of Greek theoretical formalism but highly resonant with it.

The link to Zoroastrianism becomes clearer when we consider the role of the Magi—Zarathustra's priestly class—not only as religious functionaries but as keepers of astronomical and mathematical knowledge. According to Boyce (1979), the Magi were custodians of cosmic order (*asha*), and mathematics, particularly geometry, was central to their ritual practice and calendar calculation. The Magi interpreted the heavens and measured time with remarkable precision, using geometrical tools to structure their liturgical year and align sacred events with celestial movements. This blend of spiritual cosmology and exact science reflects the very Zoroastrian worldview that interwove ethical dualism with mathematical balance.

It is within this intellectual environment that Pythagoras encountered the Magi during his time in Babylon, as reported by Iamblichus. While Pythagoras is credited with introducing the theorem that bears his name into formal deductive geometry, it is historically plausible that he was influenced by the Zoroastrian-Magian tradition, which already employed mathematical principles for religious and cosmological ends. His philosophical system—rooted in numerical harmony, geometric purity, and cosmic balance—may thus reflect the transcultural absorption of Zoroastrian values and practices, mediated through the Magian priesthood.

The Susa tablet, then, is more than an artifact of technical ingenuity. It is a testament to a cultural and intellectual continuity where mathematics served spiritual truth, and where the seeds of Pythagorean doctrine may have been sown in the fertile soil of ancient Zoroastrian Persia. In this light, the famed Greek formula becomes not merely a Hellenic innovation, but part of a deeper and older Zoroastrian cosmological heritage—one that united ethics, astronomy, and sacred number in the pursuit of divine order.


*Representative clay tablet from Susa, dating to circa 1750 BCE. Preserved in the British Museum, this artifact demonstrates advanced geometrical understanding that parallels Pythagorean principles.*

**Zoroastrianism's Spiritual Influence in the Ancient World**

According to Ruhi Afnan (1965), Pythagoreanism was a religious revival and an awakening directly or indirectly stimulated by Zoroastrianism, and this is not as unlikely as it may initially seem. A similar awakening occurred during the same period among the Jews. This was also due to direct contact with Zoroastrianism during the time of its emergence, when its spirit was dominant, its teachings pure, and its values highly spiritual and cultural. As reported and judged by their own prophets, the Jews were defeated and taken as prisoners by the

Babylonians because they had adopted pagan practices and beliefs, and as a result, had completely abandoned their ancient spiritual and cultural priorities in favor of those of other nations.

The close contact with Zoroastrianism during the exile seems to have made the Jews more aware of their own spiritual heritage. As a result, a vast majority of them embraced the new faith. However, a considerable portion clung to their old loyalties, and under the leadership of Ezra and Nehemiah, they attempted to reform themselves and return to their ancient beliefs. The direct contact with Zoroastrianism and its spiritual teachings acted as a reminder of what they had once possessed, and of the spiritual greatness they had once enjoyed.

In other words, the spiritual light spread by Zoroastrianism radiated throughout the entire Middle East—fully enlightening some, and merely awakening a sense of self-criticism in others. Some initially embraced Zoroastrianism and assimilated it into rapidly expanding communities, such as the Babylonians and Assyrians; others remained on the margins, but still sought to reinterpret their own beliefs in its light.

The Jewish reform under Ezra was one such reaction; the revival of Greek religion during that period was another outcome. And Pythagoreanism was yet another of those movements.

**Ethical Parallels Between Zoroastrians and Pythagoreans**

In their ethical practices, the Pythagoreans were renowned for their mutual friendship, detachment, and honesty—just as the Zoroastrians were, through their promotion of the fundamental principles of life.

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**Conclusions**

The historical and philosophical journey outlined in this article reveals a compelling narrative of influence, convergence, and shared ethical vision between Zarathustra and Pythagoras. Although no definitive proof confirms a direct meeting between the two figures, the conceptual parallels in their cosmological and ethical frameworks suggest a channel of transmission—direct or indirect—through the Zoroastrian tradition.

Zarathustra's dualistic ethics, as articulated in the *Gathas*, provided one of the earliest known articulations of moral choice based on opposing mentalities—truth and falsehood, good and evil (Jafarey, 1989). This resonates with Pythagoras's doctrine of opposites, which framed reality through binary principles such as limited/unlimited and light/darkness (De Crescenzo, 1995). These philosophical constructs, while different in form, share a structural affinity that points to a common concern with cosmic order and moral alignment.

The philosophical idea of *philosophia*, often credited to Pythagoras, gains new dimension when seen in the light of Zarathustra's earlier use of *Vohu-Manah*, or "Good Mind," which embodies a path toward divine wisdom through righteous living (Abreu, 2000). Both traditions advance a view in which knowledge is not merely intellectual, but spiritual—an awakening to the inherent order of the cosmos and the divinity within.

Their mutual engagement with astronomy and mathematics further exemplifies this convergence. Zarathustra's reform of the Indo-Iranian calendar (Jafarey, 1989) and Pythagoras's identification of the Earth as spherical (De Crescenzo, 1995) reflect a shared reverence for the heavens as the ultimate symbol of order. The discovery of the Susa tablet, potentially linked to early geometric theory, lends archaeological support to the idea that Eastern traditions may have indirectly shaped Greek scientific thought (Afnan, 1965).

The spiritual and ethical influence of Zoroastrianism extended beyond Pythagoras to other religious movements, including post-exilic Judaism and early Hellenistic philosophy. As Afnan (1965) points out, the Zoroastrian revival was not isolated but rather radiated throughout the ancient world, triggering moral and spiritual awakenings across cultures.

The legacy of Zarathustra in the philosophy of Pythagoras is more than speculative comparison; it is a profound reflection of the enduring human quest for order, justice, and transcendence. Their teachings, though shaped by different cultural matrices, converge on a universal message: wisdom is not merely the love of knowledge, but the path to a harmonious and righteous life.

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*Iamblichus (Nació en el año 250 DC en Chalcis en Coele Syria [Ahora en el Libano], Murió en el 330) fué un filosofo Sirio que jugo un gran papel en el desarrollo del Neo-Platonismo. Sus escritos que han sobrevivido incluyen: On the Pythagorean Life; The Exhortation to Philosophy; On the General Science of Mathematics; On the Arithmetic of Nicomachus; and Theological Principles of Arithmetic. El tuvo una gran influencia en Proclus.

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